

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application:

1 1. (Currently Amended) A method of forming a microcrystalline thin film, comprising:
2 supplying, during a first process, ~~a first gas~~ SiH₄ and ~~a second gas~~ H₂ to a chamber in
3 which a substrate is located;
4 supplying, during a second process, ~~the second gas~~ H₂ but not ~~the first gas~~ SiH₄ to the
5 chamber;
6 depositing a portion of the microcrystalline thin film during the second process; and
7 performing the first process and second process a plurality of times to form the
8 microcrystalline thin film having a target film thickness on the substrate.

1 2. (Cancelled)

1 3. (Currently Amended) The method of claim ~~[[2]]~~ 1, wherein performing the first process
2 and second process a plurality of times is performed without removing the substrate from the
3 chamber.

1 4. (Original) The method of claim 3, further comprising applying an electric field in the
2 chamber to break down the SiH₄ to SiH₂.

1 5. (Currently Amended) The method of claim 4, wherein supplying the H₂ comprises
2 supplying the H₂ at a generally constant rate, ~~and wherein supplying the SiH₄ comprises~~
3 ~~supplying the SiH₄ at a first rate during the first process but not supplying the SiH₄ during the~~
4 ~~second process.~~

1 6. (Original) The method of claim 4, further comprising depositing the SiH₂ to a surface of
2 the substrate during the second process.

1 7. (Currently Amended) The method of claim 1, further comprising:
2 converting ~~the first gas~~ SiH_4 to ~~a third gas~~ SiH_2 ; and
3 depositing ~~the third gas~~ SiH_2 on the substrate during the second process.

1 8. (Currently Amended) The method of claim 7, wherein depositing ~~the third gas~~ SiH_2 on
2 the substrate during the second process without supplying ~~the first gas~~ SiH_4 reduces formation of
3 a polymer ~~of the third gas~~ due to SiH_2 molecules encountering each other prior to depositing of
4 ~~the third gas~~ SiH_2 on the substrate.

1 9. (Currently Amended) A method of forming a microcrystalline thin film by activating
2 SiH_4 ~~a first source gas containing an element that forms a polymer when a plurality of molecules~~
3 ~~of the element are bonded in a vapor phase~~, and forming a film having a microcrystalline
4 structure ~~primarily composed of said element~~ on a film forming target object, wherein activating
5 ~~the first source gas~~ SiH_4 comprises applying an electric field to break down ~~the first source gas~~
6 SiH_4 to ~~a second gas~~ SiH_2 , the method further comprising:
7 performing a source supplying process in which ~~said first source gas~~ SiH_4 is supplied,
8 and
9 performing a source depositing process in which the supply of ~~said first source gas~~ SiH_4
10 is stopped and ~~said second gas~~ SiH_2 is deposited on the film forming target object to form the
11 microcrystalline structure.

1 10. (Currently Amended) The method of claim 9, wherein bonding of ~~the second gas~~ SiH_2 is
2 suppressed in the source depositing process.

1 11. (Currently Amended) The method of claim 9, wherein H_2 ~~a third gas that does not form a~~
2 ~~polymer when bonding with itself in the vapor phase~~ is supplied in said source supplying process
3 and said source depositing process.

1 12. (Currently Amended) The method of claim 11, wherein ~~the third gas~~ H_2 is supplied at a
2 constant flow rate throughout said source supplying process and said source depositing process.

1 13. (Currently Amended) The method of claim 11, wherein a flow rate ratio, r , of ~~said first~~
2 ~~source gas~~ SiH₄ and ~~said third gas~~ H₂ satisfies
3 $r \geq - (7/12) \times P + 72.5$, where P is an electric field intensity density irradiated on ~~said first source~~
4 ~~gas~~ SiH₄ and ~~said third gas~~ H₂.

1 14. (Previously Presented) The method of claim 9, wherein performing said source
2 supplying process comprises performing the source supplying process for 2 seconds or less, and
3 performing said source depositing process comprises performing said source depositing process
4 for longer than said source supplying process.

1 15.-16. (Cancelled)

1 17. (Original) A method of manufacturing a thin film transistor comprising:
2 forming a gate electrode on the substrate;
3 forming an insulation layer film on said substrate and said gate electrode,
4 forming at least a portion of a channel layer film on said insulation layer by using the
5 microcrystalline thin film forming method of claim 9; and
6 forming a source/drain electrode on said channel layer.

1 18. (Previously Presented) The method of manufacturing a thin film transistor of claim 17,
2 wherein forming the channel layer film comprises forming the microcrystalline thin film up to 1
3 nm away into the channel layer film from the interface with said insulation layer.

1 19.-25. (Cancelled)

1 26. (Currently Amended) The method of claim 1, wherein supplying ~~the first gas~~ SiH₄ and
2 ~~second gas~~ H₂ during the first process comprises supplying ~~the first gas~~ SiH₄ at a first rate and
3 ~~the second gas~~ H₂ at ~~the~~ a second rate, the first rate and second rate defining a flow rate ratio that
4 prevents a thin film formed on the substrate from becoming amorphous.

1 27. (Previously Presented) The method of claim 26, further comprising applying an electric
2 field during the first process, the electric field set at an intensity that in combination with the
3 flow rate ratio prevents a thin film formed on the substrate from becoming amorphous.

1 28. (Currently Amended) The method of claim 9, further comprising supplying a ~~third gas~~
2 H₂ during the source supplying process and during the source depositing process, ~~the first source~~
3 ~~gas SiH₄ and the third gas H₂~~ being supplied at flow rates during the source supplying process to
4 prevent a film formed on the film forming target object from becoming amorphous.

1 29. (Currently Amended) A method of forming a microcrystalline thin film, comprising:
2 supplying a ~~first gas SiH₄ and second gas H₂~~ to a chamber in which a substrate is located;
3 and
4 depositing the microcrystalline thin film on the substrate, wherein prior to depositing the
5 microcrystalline thin film, the supplying of ~~the first gas SiH₄~~ to the chamber is stopped.

1 30. (Previously Presented) The method of claim 29, wherein depositing the microcrystalline
2 thin film forms a majority of the microcrystalline thin film on the substrate.

1 31. (New) The method of claim 29, wherein supplying SiH₄ and H₂ during the first process
2 comprises supplying SiH₄ at a first rate and H₂ at a second rate, the first rate and second rate
3 defining a flow rate ratio that prevents a thin film formed on the substrate from becoming
4 amorphous.